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AUTHOR	Kilgour, Frederick G.
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ABSTRACT

Computerization of acquisitions activity is a technological advance already underway. Like all advances in technology it requires advances in knowledge, and future advances will occur only after research has produced the necessary knowledge. Comprehensive system design made possible by computerization will provide acquisitions with the objective of participating in academic educational and research programs. Finally, computerization of acquisitions constituting a continuously productive new technology will contribute to elimination of the financial crisis in which academic libraries now find themselves. (Author)

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EFFECT OF COMPUTERIZATION ON ACQUISITIONS

by

Frederick G. Kilgour
Director, Library Center
Ohio College

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The advent of the computer in the academic library promises revolution in library objectives and economics, and the extent of the revolution will be as great in acquisitions as in other library areas. This paper will examine the probable effects of computerization in the foreseeable and distant futures and will establish academic and economic targets at which to aim to avoid an inefficient wandering forward. The first section of the paper will inquire into the characteristics of the new technology; the second will delineate academic objectives and new techniques for reaching those objectives; and the third will discuss the economic goals of acquisitions computerization.

THE NEW TECHNOLOGY

A new technology can be characterized as a new method that produces old products, as a new method that produces old products with new qualities, as a new method of organization, or as a new method for supervision or management. Technological advance requires an advance in knowledge. A change in technique is not a technological advance, for it involves merely a variation in equipment or products. It is characterized by communication of information rather than development of new knowledge (1).

The application of computers to acquisitions activities will be a technological advance that will require much new knowledge. The major impediment to advance is not a lack of capability in computers or a deficit in understanding of their operation. Rather, the principal obstacle is the incompleteness of knowledge required to employ a new technology to produce new products, new organization, or new management methods. Only fruitful research and development can produce the necessary knowledge rapidly; the classical empiricism of librarianship has become woefully inadequate (2).

Computerized acquisitions systems employ a new technology to produce essentially old products, such as purchase orders, and products with important new characteristics, such as bookform listings of items in the system arranged by author and by order number. Examples of such systems are at the University of Newcastle (3, 4), University of Michigan (5), Yale (6), Texas A&I University (7), Oakland University (8), Lorain County Community College (9), the Atomic Weapons Research Establishment at Aldermaston (10), and the University Library at Bochum (11), all being batch systems. The most sophisticated of the batch systems is at

Cornell, but a technical report describing the Cornell system has not yet appeared.

Washington State University was first to make a major technological advance in introducing its operational on-line system (12). Access to the file is by purchase order number from remote terminals in the acquisitions department. Subsequently, Stanford activated its on-line system providing access by author's surname or any non-structure word in the title. Access may also be achieved by a conjunction among title words or with surname, and since the Stanford system employs only the first three letters of each name or word in its indexing, the effect of spelling errors is largely diminished. It is also possible to define further a request put to the Stanford system by including other data such as imprint date. For example, a request for books by Smith will yield a listing on the terminal of all entries having the main entries Smith, but if the request also includes 1969, the response will contain only those entries under Smith bearing the imprint date 1969.

Some systems under development provide for wholly new products, such as computerization of some aspects

of supervision not heretofore possible and provision of management information. For example, the Yale system is designed to produce various periodic special reports of activities within the system and currently provides information on a weekly basis as to amounts of processing in areas such as pre-order searching, post-receipt searching, and cataloging.

Introduction of new supervisory activity is made possible by computerization because of the computer's happy ability to treat each person or each individual event as being unique and not as one of many. It is much to the credit of librarians that they have devised technical processing systems operating with mass-production and assembly-line procedures but yielding individual products, each unlike any other item in the system. In large systems, acquisitions processing is an assembly-line flow, with each book being treated as an item in the stream and not as an individual book. Moreover, librarians tend to discourage treatment of items as individual titles because such treatment introduces special and time-consuming activities equated with inefficiency. However, the computer can direct progress through the system on an item-by-item basis, rather than on the mass basis required by classical procedures.

It is entirely feasible, even in the largest systems, for a computer to calculate the value of a function for each item in the system on a periodic basis that may be weekly, bi-weekly, or monthly. An example is the following function f (6):

$$MA = f\ (m, s, t, u)$$

where

MA is machine action;

m is the type of material (request, order, book);

s is the location of the material in the system;

t is time spent in the present location; and

u is the urgency for processing assigned to the particular item.

The computer can be instructed to find automatically values for m, s, and t, but it would be necessary for a human being to assign a value for u when urgency is exceptional. Whenever the value of MA for an individual title exceeds a preset threshold, the computer would dispatch a notice to the appropriate supervisor informing the supervisor that the specific item should be moved on. As Alanen and her colleagues pointed out, it would be possible to add to m, s, t, and u, other independent variables for language, place of publication, imprint date, and cost of item, and there may well be others that could prove desirable.

The advent of the computer in libraries also makes it possible to look at a library as a comprehensive system of which acquisitions is a subsystem. In the classical view a library is an organization consisting of separate departments, each with its own procedures, and having a flow of information and materials among departments - a flow with potential for uncomfortable turbulence.

A comprehensive system would contain a file of master records, each record having associated with it acquisitions, cataloging, circulation, and indexing information necessary for continuous library operation. Such a system requires on-line computer access like that at Washington State and Stanford. Some libraries now marry at considerable expense the author/title outstanding order file with one of the library's catalogs. However, newer systems will be based on a file containing all acquisitons and all cataloging information. Since these large systems are expensive, most libraries will participate in them on a regional basis, thereby enabling them to reduce duplication of effort by taking advantage of acquisitions and cataloging data developed at neighboring institutions.

The major intellectual challenge in these large, on-line systems is design of a huge, efficient file of bibliographic entries. Here is an area of technological innovation that will require an advance in knowledge. It will be necessary to carry out a considerable amount of directed research to produce the new knowledge required. Existing evidence of patron use of library catalogs is slim, but it indicates that 75 to 80 percent of patron usage is of main entry. Of course, use by library staff is almost entirely main entry; reference staff is excepted from this statement because reference use is patron use. Therefore, the new file organization should provide the most swift retrieval for author/title searches.

A fruitful concept is that of a huge file of perhaps millions of entries divided into a large number of microcatalogs that might average fifty or fewer entries and to each of which the computer could have access at great speed. These microcatalogs could be searched by the computer and produce a subset of entries, or mini-list, which would be displayed on a terminal to the requester who would then ask the computer for additional information about the particular entry desired.

As stated above, the entry would have associated with it technical processing, cataloging, and circulation information, as well as index files by subject and added entries. The Stanford file is not exactly like the conceptual file proposed because all accesses, including that by author/title, are via indexes. Nevertheless, the Stanford file employs a key derived from an entry's bibliographic information, and it is imperative that this type of derived key be used, for a patron possesses only bibliographic information. At least three centers have done investigations pointing toward use of keys derived from bibliographic information to compute addresses of entries in huge files (13, 14, 15).

A new catalog organization, in which the user, whether library staff member or patron, nine times out of ten receives a mini-list containing perhaps fifteen or fewer entries, will place far less stringent and detailed requirements on enumerative bibliography. Only meager bibliographic information is required to distinguish one entry among fifteen. Indeed, the information on a title page, providing imprint date is present, is far more than adequate for either the user's or the system's requirements.

OBJECTIVES OF ACADEMIC LIBRARIES

Until a century ago, academic libraries were concerned only with conservation of books, and most were open only an hour or two, or a day or two, each week. During the past hundred years, academic libraries have opened their doors for longer periods of time and have developed a service function for faculty and students. Increased size of academic libraries has caused some degradation in desirable aspects of service, but at the present time it is becoming apparent that the service function is not enough. Rather, the academic library should participate in the specific educational and research programs of its institution. Such participation is almost impossible for classical librarianship except in the smallest of institutions, but the computer holds out the hope for integration of library activity with institutional programs.

Whenever a library establishes the objective of participation in specific programs, acquisitions departments will have the same objective. One method for attaining such an objective will be maintenance of book stock for education and research that will involve having available specific titles for use in specific programs in numbers of copies adequate to meet demand.

Selection of new titles will be facilitated by use of newly received machine readable bibliographic records such as those on MARC II and BNB MARC magnetic tapes. J. G. Veenstra (16) has described use of MARC I tapes for selection at the University of Florida, where a listing of all records in a truncated format was circulated to selection officers. D. L. Weisbrod (17) reported a New Titles Alerting Service using MARC I data and furnishing Yale's Kline Science Center Library with a listing of new records in certain Library of Congress science classes. Operating on a different set of selection classes, the Service also supplied listings of new titles to the Yale Medical Library. F. H. Ayres (18) has suggested a similar employment for small libraries of the BNB MARC tapes.

Future integrated on-line systems will monitor incoming requests from terminals so that it will be possible to construct use profiles from such logs. Selection personnel would use these profiles as a guide to selection. These logs will record requests, whether filled or unfilled, by individual title so that it will be possible automatically to order additional copies of a specific title when demand exceeds a preestablished value. The algorithm that would perform automatic

ordering would be complex, for it would be necessary to relate time of year and number of days over which requests occur to the threshold value. Such automatic ordering is not an event in the immediate future, but it is a technique to which acquisitions librarians can look forward.

Responsibility for maintaining book stock required by educational and research programs will include not only acquisitions of materials, but also discard of materials no longer required. Computer monitored information, or rather absence thereof, would generate computer produced reports containing suggestions for items to be discarded. An algorithm designed to report duplicate copies unused over several academic periods could be easily designed, but there is no reason why a more complicated algorithm could not be constructed that would be even more useful in suggesting discard of unused items held in one copy. Such a technique would be a major contribution to stabilization of size of college library collections; it would contribute less to university library collections as long as it is necessary for university libraries to continue to enlarge their resource holdings for research in the humanities and social sciences.

ECONOMIC GOAL

Until the advent of the computer, librarians were restricted to paying almost exclusive attention to economies rather than to economics. Fortunately the computer has arrived on the scene at a time when the financial crisis of academic institutions including their libraries is reaching overwhelming proportions. Although it is not at all clear that computers will be an immediate salvation for colleges and universities as a whole, there is real hope that they can diminish the financial plight of academic libraries.

Librarians have been most skillful in devising economies for internal library operation, although some of these economies have forced upon users increases of expenditures of time, and therefore money. In general, it can be said that economies have temporarily lowered expenditures required by individual procedures, but salary increases forced by the rising standard of living steadily outdistance the economies. The problem here is that libraries do not enjoy a technology that is increasingly and continuously productive. By and large, whenever a library wishes to increase its activity by 10 percent, it must increase its staff by 10 percent. Whereas the total productivity index has been in excess of 2 percent

annually for the decades following World War I, it is doubtful that librarianship has experienced any significant increase in its productivity index. Indeed, during the period 1959/60 to 1965/66, academic library operating costs per student rose about five percent annually (19) or approximately twice as much as costs in the general economy. The only solution to the present financial crisis is reduction in rate of cost rise to that in the general economy. There are two obvious routes to this goal: 1) an annual exponential decrease in library activity; or 2) development of an innovative library technology possessing a continuously increasing productivity such as that which the economy as a whole enjoys. Clearly, the second course is preferable, and there is no other vehicle in sight other than computerization that can transport libraries along that route.

It has been pointed out elsewhere (20) that productivity of descriptive catalogers has probably not increased since the Middle Ages, but that the productivity of the successors to the medieval scribes that produced copies of catalogs has increased about two thousand percent. Of course, this increase occurred following the invention of printing from movable type in the middle of the fifteenth century. It was shown above that new design of a computerized catalog that will surely come into being in the

next couple of years will make possible mechanization of descriptive cataloging that could almost, but not quite, eliminate human activity from enumerative bibliography. Unfortunately, the prospect for eliminating manual transcription to machine readable form is not as bright. Of course, requirements for enumerative bibliography in acquisitions activity are not nearly as high as those for cataloging except when an outstanding order file is wedded to a catalog, and it can be expected that in the future with the development of on-line systems there will be a diminishing need for bibliographic control as it has been known in the past.

In short, the goal of computerization of acquisitions activities should be increasing mechanization not only of clerical operations, but also of professional, supervisory, and management functions by invoking an innovative technology that will steadily increase productivity of staff. At the same time, staff members will be divested of essentially mechanical activities so that to an increasingly larger extent their work will require their uniquely human attributes.

SUMMARY

Computerization of acquisitions activity is a technological advance already underway. Like all advances in technology it requires advances in knowledge, and future advances will occur only after research has produced the necessary knowledge. Comprehensive system design made possible by computerization will provide acquisitions with the objective of participating in academic educational and research programs. Finally, computerization of acquisitions constituting a continuously productive new technology will contribute to elimination of the financial crisis in which academic libraries now find themselves.

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